



## What is the Advanced Manufacturing Systems Program?

The Advanced Manufacturing Systems Program (ADM) is designed to prepare students to enter the advanced manufacturing process and distribution industry. The ADM industry requires multi-skilled professionals to operate, maintain, trouble-shoot, and engineer complex systems used in a variety of today's industries. The ADM degree and certificate program allows students to earn progressive levels of certificates that can be applied towards employment or an associate degree. The coursework within the program consists of critical thinking and soft skills, as well as applied lab work in electrical, electronic, and mechanical technologies, and their interactions in advanced manufacturing systems.

## Why choose the Advanced Manufacturing Systems Program?

The manufacturing industry has changed significantly over the past decade as a result of global competition. This has created a new demand for higher-level base skills than previously required. Jobs that once required basic knowledge have been replaced with automation, many of which are microprocessor and computer-based and often incorporate robotics and pick and place units. The need for skilled workers to design,

maintain, and trouble-shoot this equipment continues to increase with the development of new technologies.

The type of students who excel in this program are those that enjoy a challenge, have good communication skills, enjoy problem solving, being creative, and working with their hands, as well as their minds.

## What do the advanced manufacturing students learn?

ADM students learn the necessary skills required to support advanced manufacturing systems in a variety of applications. These include:

- Mechanical fundamentals
- Precision alignment and measurements
- Fluid power
- CNC
- Electricity
- Drawings
- Circuits and schematics
- Basic electronics
- PLC
- Motors and drives
- Safety
- Lean manufacturing and quality assurance concepts
- Advanced machine concepts
- Robotics
- Pick and place
- Networking

## What is the employment outlook for Advanced Manufacturing Systems jobs?

According to the U.S. Department of Labor, the median salary for electro-mechanical technicians in 2017 was \$56,740. Similar occupation opportunities including electrical and electronic engineer technicians, and electrical and electronic installers and repairers, offer salaries up to \$61,000, at the associate degree level. (Source: [www.bls.gov/ooh](http://www.bls.gov/ooh))

## What makes HCC's program special?

HCC is not new to offering state-of-the-art manufacturing and industry training. Over the years, HCC has provided critical

training to many companies in the region, offering foundation and special skills. Courses are taught by industry-experienced faculty who continue advancing, along with industry. HCC's experience and continued investments in facilities and state-of-the-art teaching tools offer students the competitive edge needed to succeed in many industries.

Important information about the educational debt, earnings, and completion rates of students who attended this program can be viewed at [www.hagerstowncc.edu/gepd](http://www.hagerstowncc.edu/gepd).

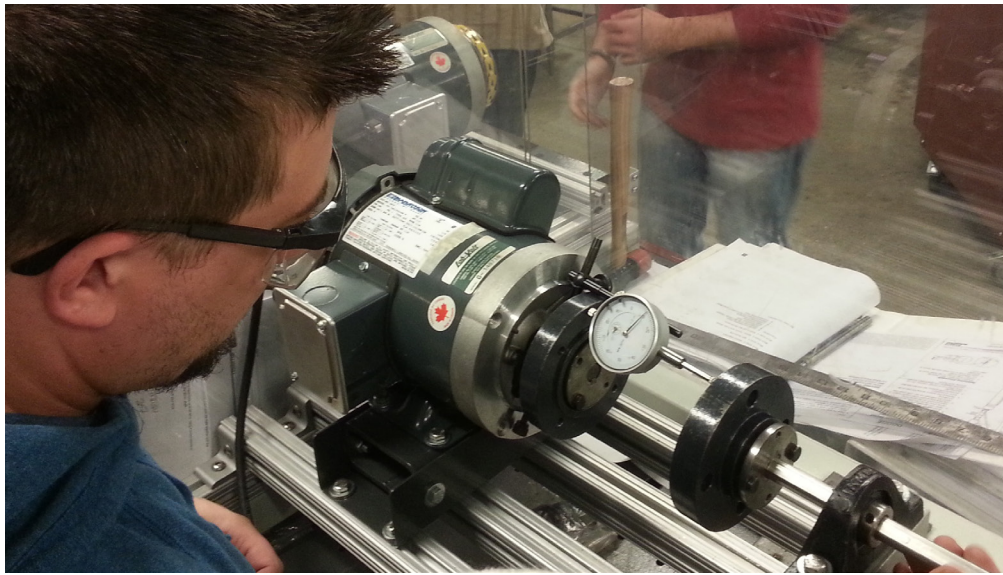
Additionally, scholarship resources are available for students studying STEM programs. For more information, visit [www.hagerstowncc.edu/scholarships](http://www.hagerstowncc.edu/scholarships).

## What other industries does the program support?

The following industries support and offer opportunities in ADM:

- Pharmaceutical and chemical companies
- Warehouse and distribution systems
- CNC machine shops
- Automated building systems
- Smart electrical grid technology
- Cybersecurity

*"Many new jobs in the sector are in the information technology field and require workers who can operate networked robotic machines, develop software, and manipulate electronic databases. Along with these developments, the demand for assembly-line workers has declined. Requirements for critical-thinking skills have also increased with changes in technology, rivaling those for product design and creation. Workers with advanced manufacturing skills are now more in demand than are workers with little or no skills." U.S. Department of Labor (Source: [www.bls.gov](http://www.bls.gov))*



*A.A.S. Degree*

**Advanced Manufacturing Systems**

The Advanced Manufacturing Systems Program provides a sequence of technical and manufacturing courses for students who are currently in, or plan to enter, today's advanced manufacturing environment where multi-skilled workers are in high demand. Students wishing to continue their education beyond the A.A.S. degree in the areas of manufacturing engineering and management will benefit from the program as well.

**General Education Requirements 21-22 credits**

**Arts/Humanities**

Select from the approved General Education course list.....3

**Behavioral/Social Sciences**

Select from the approved General Education course list.....3

**Biological/Physical Science**

(Students intending to transfer should take the General Physics course)

PHY 112 Applied Physics.....3

**OR**

PHY 201 General Physics.....4

**Diversity**

Select from the approved General Education course list.....3

**English**

ENG 101 English Composition.....3

*\*minimum grade of "C" or better is required*

**AND**

Select from the approved General Education course list.....3

**Mathematics**

MAT 101 College Algebra.....3

**OR**

MAT 114 Introduction to Applied Algebra.....3

**Program Requirements 36 credits**

ELE 158 Circuits, Schematics, and Test Equipment...3

INT 101 Introduction to Industrial Technology.....3

ELE 110 Fundamentals of Electricity.....4

ELE 113 Instrumentation and Process Control I.....3

ELE 103 Analog and Digital Electronics .....3

INT 102 Introduction to PLCs .....3

ADM 258 Advanced Motors, Machines, and Devices .....3

ADM 201 Lean Manufacturing and Quality Assurance .....2

CSC 132 Introduction to C and C++ Programming .....3

ELE 203 PLC Applications .....3

EGT 150 Introduction to CNC Programming .....3

ELE 140 Introduction to Robotics.....3

**Restricted Electives 3 credits**

Select at least three credits from the following:

ADM 269 Internship..... (3)

CAD 228 CAD Solid Modeling ..... (3)

EGT 250 Advanced CNC ..... (3)

EGT 235 Fluid Power ..... (3)

INT 240 Industrial Tech Capstone Project..... (1)

**Degree Requirement.....60**

*Certificate*

**Industrial Technology**

The Certificate in Industrial Technology provides students with a fundamental knowledge of the manufacturing environment with a focus on multi-skilled operators and technicians. Basic mechanical and electrical theory as well as functionality and maintenance are covered. This certificate is beneficial for production operators as well as technicians.

**Program Requirements 16 credits**

ELE 110 Fundamentals of Electricity.....4

INT 101 Introduction to Industrial Technology.....3

INT 102 Introduction to PLCs.....3

ELE 158 Circuits, Schematics, and Test Equipment...3

ADM 258 Advanced Motors, Machines, and Devices...3

**Certificate Requirement.....16**

*Certificate*  
**Basic Electronics**

The Certificate in Basic Electronics provides students with the skills required to analyze and repair basic electronics circuits in the manufacturing environment, including evaluating the root cause of component failure to avoid unnecessary equipment down time and repeated failures.

**Program Requirements 16 credits**

ELE 110 Fundamentals of Electricity.....4

ELE 158 Circuits, Schematics, and Test Equipment...3

ELE 113 Instrumentation and Process Control I.....3

ELE 103 Analog and Digital Electronics .....3

INT 102 Introduction to PLCs .....3

**Certificate Requirement.....16**

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